

REMARKS

Claims 1, 2, 5, 6, 7, 8, 9, 10 have been amended. No new claims have been added and no claims have been canceled. Accordingly, claims 1-12 remain under prosecution in this application.

The examiner stated the following:

(a) Sandell fails to teach a polarization of the antenna used by the first transmission unit being orthogonal to a polarization polarity of the antenna used by the second transmission unit, and wherein an inclination of the first receive antenna to the first transmit antenna being approximately equal to an inclination of the second receive antenna to the second transmit antenna; and

(b) Hamalainen teaches two orthogonally polarized transmit antennas with each having a 45 degree inclination.

However, Sandell merely discloses the following as to space-time coding:

[0027] FIG. 4 shows a space-time coded MIMO-OFDM communications system 400 similar to that discussed by Li et al. A block of input data 402 $b[n,k]$ at transmission time (or OFDM symbol or frame) n, k labelling elements of the block, is processed by a coding machine 404 which performs a space-time encoding operation. The input data may already be forward error corrected for example by a block encoder. The space-time (ST) encoder 404 provides a plurality of output signal blocks $t_i[n,k]$ (Li et al consider a two transmit antenna case, $i=1,2$) for driving a plurality of IFFT (Inverse Fast Fourier Transformation) blocks 406, which in turn drive corresponding rf stages 408 and transmit antennas 410....

Accordingly, the space-time coding of Sandell merely changes the order of symbols.

As compared to this, in the present invention, the

(a) QPSK modulation is used and therefore a complex number is the object of space-time coding;

(b) Alamouti scheme is used for space-time coding and therefore two complex signals are **orthogonal** with each other;

- (c) polarization polarities of two transmit antennas are **orthogonal with each other;**
- (d) In the receiver side, polarization polarities of two receive antennas are orthogonal with each other;
- (e) Alamouti scheme is used for space-time decoding;
- (f) QPSK is used for demodulation.

In other words, the present invention employs such a combination of modulation, space-time coding, polarization polarities of two transmit antennas that can realize the two orthogonal properties of various conceivable combinations of the above factors.

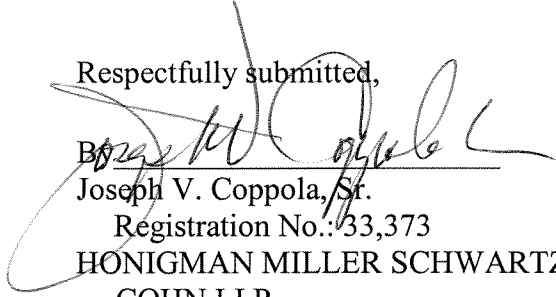
By realizing the two orthogonal properties at a same time, the performance of the present invention is far better than that is expectable for a person with ordinary skill in the art. Therefore, the present invention is new and non-obvious over the cited references.

In view of the above amendment, applicant believes the pending application is in condition for allowance.

Any fee due with the filing of this response may be charged to Deposit Account No. 50-3145, under Order No. 215384-106379 from which the undersigned is authorized to draw.

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